

VOLUME 3. AIR OPERATOR TECHNICAL ADMINISTRATION

CHAPTER 6. OPERATIONAL CONTROL

SECTION 4. PART 121 FLAG OPERATIONS, SUPPLEMENTAL OPERATIONS OUTSIDE THE CONTIGUOUS STATES, AND EXTENDED OVERWATER OPERATIONS

1229. GENERAL. This section contains information and guidance to be used by inspectors concerning the following Part 121 operations: flag operations, supplemental operations outside the contiguous United States, and extended overwater operations. The following general provisions apply to Part 121 operators conducting extended overwater operations.

A. Instrument flight rules (IFR) and visual flight rules (VFR) Authorizations. Part 121 operators must conduct extended overwater operations under IFR unless they show that operating under IFR is not necessary for safety. An authorization to conduct extended overwater operations under VFR rules is seldom granted. When granted, such an authorization is contained in Operations Specifications (OpSpecs) B051 and C077 of the operator's OpSpecs (see volume 3, chapter 1, sections 3 and 4).

B. *Land Airplanes.* A Part 121 operator may not operate a land airplane (except certain two engine reciprocating engine-powered airplanes listed in part 121, section 121.161(b)) in extended overwater operations unless the airplane is certified for ditching under Part 25. When an aircraft is certified for extended overwater operations, these operations will appear as authorized operations in the limitations section of the approved airplane flight manual (AFM) or approved rotorcraft flight manual (RFM), as appropriate.

1231. DESTINATION WEATHER MINIMUMS.

Part 121, section 121.615(a) states the following: "No person may dispatch or release an aircraft for a flight that involves extended overwater operation unless appropriate weather reports or forecasts, or any combination thereof, indicate that the weather conditions will be at or above the authorized minimums at the estimated time of arrival (ETA) at any airport to which dispatched or released or to any required alternate." This regulation has been interpreted by the Federal

Aviation Administration's (FAA) Chief Council (AGC) to mean that weather conditions must be forecasted to be above the required minimums at the ETA, but the weather conditions do not necessarily have to be above the required minimums at the time of dispatch or release.

A. *Category I, Category II, and Category III Weather Minimums.* Category I (CAT I) weather minimums are stated in OpSpecs C053/C074. CAT II and CAT III minimums are listed in paragraphs C059 and C060 of the OpSpecs, respectively.

B. *Weather Forecasting for Extended Flight Operations.* Extended overwater operations may require flight times of 10 or more hours. Since the certainty of weather forecasts deteriorates as the period of the forecast lengthens, meteorologists usually add conditional phrases to the remarks of these forecasts to alert the users to this uncertainty. Operators may, as a result of these conditional remarks, find it difficult to dispatch or release to the desired destination and to find acceptable alternate airports. Aircraft dispatchers and flight followers have a number of methods at their disposal, however, to overcome these limitations.

(1) The installation of CAT II and CAT III approach aids have resulted in destination weather minimums as low as a ceiling of zero and a runway visual range of 600 feet. Modern facilities have also resulted in alternate weather minimums authorized by OpSpecs being reduced to as low as 400 feet and 1 mile.

(2) Operators may release a flight to an intermediate destination and then redispach or rerelease the flight to the actual destination while the flight is en route. The redispach or rerelease can be based on current weather reports and short term forecasts.

(3) Under an approved enhanced weather information system (EWINS), a meteorologist or a quali-

fied aircraft dispatcher employed by an operator may issue a flight movement forecast (FMF) based on a detailed analysis of the conditions surrounding the specific flight. An FMF may be used for operational control of the specific flight (see chapter 7, section 4 of this volume).

1233. DESIGNATION OF DESTINATION ALTERNATE AIRPORTS. The limitations of OpSpec B043 (special fuel reserves) prohibit operators from releasing flights under the provisions of these paragraphs without designating an alternate airport. The following provisions apply to the designation of destination alternate airports in Part 121 flag or extended overwater supplemental operations:

A. Destinations Without an Alternate Airport. Sections 121.621 and 121.623(b) authorize an operator to dispatch flag and release supplemental flights to a destination for which no alternate airport is available. These provisions were originally provided for reciprocating aircraft operations en route to island destinations. The introduction of turbojet aircraft has largely negated the need for the rule; however, there are still some destinations (such as Easter Island) for which the rule is still required. Before an operator can dispatch or release under this rule, the specific route must be authorized by the OpSpecs. Inspectors must ensure that operators have applied the following limitations to their requirements:

(1) Sections 121.641(b) and 121.643(c) require that turbopropeller and reciprocating powered airplanes have enough fuel remaining upon arrival over the destination for the flight to continue for an additional 3 hours under normal cruise conditions.

(2) Section 121.645(c) requires that turbojet powered airplanes have enough fuel remaining upon arrival over the destination for the flight to continue for an additional 2 hours under normal cruise conditions.

(3) The routes must be specified in the operator's General Operations Manual (GOM).

B. All Other Supplemental Operations. Section 121.623 requires that operators designate an alternate airport for all supplemental operations other than those described in previous subparagraph A.

C. Flag Flights of 6 Hours or Less. Section 121.621 permits operators operating under flag rules to dispatch flights of up to 6 hours duration without designating an alternate airport. For 1 hour before, to 1

hour after the ETA, the weather must be forecasted as follows:

(1) The ceiling will be at least 1,500 feet above the lowest circling minimum descent altitude (MDA), if a circling approach is required and authorized for the airport; or

(2) The ceiling will be at least 1,500 feet above the lowest published instrument approach minimum or 2,000 feet above the airport elevation, whichever is greater; and

(3) The visibility at that airport will be at least 3 miles, or 2 miles more than the lowest applicable visibility minimums, whichever is greater, for the instrument approach procedures to be used at the destination airport.

D. Flag Flights of More Than 6 Hours. Section 121.621(a) requires that operators list an alternate airport for all flag flights of more than 6 hours duration, except those operations described in previous subparagraph A.

E. Listing of Alternate Airports. Sections 121.621 and 121.623 require that operators list each required alternate airport on the dispatch or flight release.

F. Weather Requirements for Designated Alternate Airports. Section 121.625 requires that weather reports and forecasts, or any combination thereof, must indicate that the weather at the time the aircraft is to arrive at the alternate airport will be at or above the minimums stated in paragraph C055 of the OpSpecs.

1235. REQUIRED FUEL SUPPLY: NON-TURBINE AND TURBOPROPELLER AIRPLANES. A part 121 operator must dispatch a reciprocating or turbopropeller-powered airplane in flag operations under part 121 §§ 121.641 and 121.647. An operator must release these airplanes in supplemental operations under the provisions of §§ 121.643 and 121.647.

A. Required Fuel Supplies for Flights with Alternate Airports. When the Regulations require an alternate airport for the destination to be designated on the release, the aircraft must have the following types and increments of fuel on board at takeoff:

(1) *En Route Fuel.* That fuel necessary for a flight to reach the airport to which it is released and then to conduct one instrument approach and a possible missed approach.

(2) *Alternate Fuel.* That fuel necessary for a flight to fly from the point of completion of the missed approach at the destination airport to the most distant alternate airport, make an IFR approach (if the forecast indicates such conditions will exist), and then complete a landing.

(3) *International Reserve Fuel.* That fuel necessary in addition the en route and alternate fuel increments for the flight thereafter to fly for 30 minutes.

(4) *En Route Reserve.* The additional fuel necessary for the flight thereafter, to fly 15% of the total time required to fly at normal cruising fuel consumption to the airports specified in previous subparagraphs (1) and (2) or to fly for 90 minutes at normal cruising fuel consumption (whichever is less).

(5) *Contingency Fuel.* That increment of fuel necessary for the flight to compensate for any known traffic delays and to compensate for any other condition that may delay the landing of the flight.

NOTE: The operator's GOM should contain policies and instructions to aircraft dispatchers, flight followers, and PICs for computing the amount of contingency fuel to be carried under the circumstances likely to be encountered in the operator's specific operation.

NOTE: When computing fuel requirements, all fuel must be in addition to unusable fuel.

B. Flights to Airports for Which An Alternate Airport is Not Available Within the Fuel Range of the Aircraft. A non-turbine or turbopropeller-powered airplane dispatched to an airport for which an alternate airport is not available must have enough fuel on board at takeoff to fly to that airport, make an approach and missed approach, and thereafter to fly for 3 hours at normal cruising fuel consumption.

C. Takeoff Fuel. Sections 121.641 and 121.643 clearly require that the fuel listed in previous subparagraph A be on board the aircraft at takeoff. The dispatch or flight release must include this amount. The operator's GOM should contain a clear statement of this point to pilots, aircraft dispatchers, flight followers, and to load planners.

1237. REQUIRED FUEL SUPPLY: TURBOJET-POWERED AIRPLANES.

Unless otherwise authorized by the operator's OpSpec B043, a part 121 operator must dispatch or release a turbojet-powered airplane in operations

beyond the contiguous states in compliance with §§ 121.645 and 121.647. Inspectors must ensure that the operator has covered the provisions that follow.

NOTE: Section 121.647 applies to all operations conducted under part 121.

A. Required Fuel Supplies for Flights with Alternate Airports. When an alternate airport is designated in the release, the flight must have the following types and increments of fuel on board at takeoff:

(1) *En Route Fuel.* That fuel necessary for a flight to reach the airport to which it is released and then to conduct one instrument approach and a possible missed approach.

(2) *Alternate Fuel.* That fuel necessary for a flight to fly from the point of completion of the missed approach at the destination airport to the most distant alternate airport, make an IFR approach (if the forecast indicates such conditions will exist), and then complete a landing.

(3) *En Route Reserve.* That fuel necessary for the flight to fly for a period of time equal to 10 percent of the en route time, which includes and approach and landing. This fuel requirement is computed at the weight at which the flight is expected to arrive over the destination airport.

(4) *International Reserve Fuel.* That fuel necessary thereafter, for the flight to fly for 30 minutes at holding speed at 1,500 feet above the alternate airport, or the destination airport if no alternate is required under § 121.621(a)(1). International fuel reserves are computed under standard temperature conditions.

(5) *Contingency Fuel.* That fuel necessary for a flight to compensate for any known traffic delays and to compensate for any other condition that may delay the landing of the flight.

NOTE: The operator's GOM should contain policies and instructions to aircraft dispatchers, flight followers, and PICs for computing the amount of contingency fuel to be carried under the circumstances likely to be encountered in the operator's specific operation.

NOTE: When computing fuel requirements, all fuel must be in addition to unusable fuel.

B. Required Fuel Supplies for Flights for which An Alternate Airport is Not Available Within the Fuel

Range of the Aircraft. A turbojet-powered airplane released according to §§ 121.621(a)(1) or 121.623(b) to an airport for which an alternate airport is not available must have enough fuel on board at takeoff to fly to that airport, to make an approach and to land, along with 2 hours flight time at normal cruising fuel consumption.

C. Takeoff Fuel. Sections 121.641, 121.643, and 121.645 clearly require that the fuel listed in previous subparagraph A be on board the aircraft at takeoff. The dispatch or flight release must include this amount. The operator’s GOM should contain a clear statement of this point to pilots, dispatchers, flight followers, and load planners.

1239. SPECIAL FUEL RESERVES. POIs, as representatives of the FAA Administrator, may grant flag and supplemental operators a deviation from § 121.645(b)(2) for the dispatch or release of turbojet aircraft in extended overwater operations by issuing OpSpec B043. Inspectors reviewing flights released under the provisions of OpSpec B043 should carefully review this paragraph, along with paragraph 145 of volume 3 in this handbook, and should note the method by which en route reserve fuel is computed, the method by which reserve fuel is computed, and the special limitations and provisions being imposed. Inspectors should also be aware that § 121.647 applies

to all flights conducted under part 121, including those conducted under the provisions of OpSpec B043. For example, if anticipated traffic delays or other anticipated conditions are expected to result in an increase in the amount of fuel planned for the flight, an appropriate quantity of contingency fuel must be added.

A. When an operator dispatches or releases a flight under OpSpec B043, the required en route reserve fuel is not computed for the entire time required to fly from departure point to destination. The en route reserve fuel is only applied to that portion of the flight in which the aircraft’s position cannot be determined once each hour by a Class I ICAO airways navigational facility. For example, a flight from New York to Frankfurt, Germany takes approximately 7 hours. The flight is conducted over airways by Class I station reference navigation from New York to the point at which the flight departs the standard service volume off the coast of northern Canada. The flight then proceeds by Class II navigation until again reaching the standard service volume of the Class I ICAO airways navigational facility serving the standard entry point of the European airways system. The flight then proceeds over airways by Class I station reference navigation to Frankfurt, Germany. The portion of the flight conducted by Class II navigation is approximately 3 hours.

**ILLUSTRATION OF OPSPECS PARAGRAPH B043
OPERATIONAL ANALYSIS**

	14 CFR § 121.645		Paragraph B043	
FUEL INCREMENT	TIME	POUNDS	TIME	POUNDS
En Route	7:00	126,000	7:00	124,000
En Route Reserve	:42	11,200	:18	4,800
Alternate	:10	2,700	:10	2,700
<u>Int.l Reserve</u>	<u>:30</u>	<u>10,000</u>	<u>:45</u>	<u>12,000</u>
Required Fuel		149,900		143,500

(1) Under § 121.645, 42 minutes of en route reserve fuel is required (7 hours x 60 minutes = 420 minutes x 10% = 42 minutes.) For the 7-hour flight the average fuel burn was 18,000 pounds per hour. At the end of the flight, however, the hourly fuel burn is

16,000 pounds per hour (42 minutes at 16,000 pounds per hour is 11,200 pounds [{42/60} x 16,000]). The reserve fuel is computed at 1,500 over the alternate. Since low-altitude holding results in a relatively high

fuel consumption, for the purpose of this illustration 20,000 pounds per hour is used.

(2) When the same flight is conducted under OpSpec B043, a somewhat smaller fuel load is required. Even though the time en route is equal for both flights, the lower takeoff weight of the B043 flight results in a lower en route fuel burn. The en route reserve fuel is 18 minutes (3 hours x 60 minutes = 180 minutes x 10% = 18 minutes). At 16,000 pounds per hour, 18 minutes is 4,800 pounds [18/60 x 16,000]. The reserve fuel for the OpSpec B043 flight is 45 minutes at normal cruising fuel consumption (for the weight and altitude at which the flight reaches the alternate); therefore, 45 minutes at 16,000 pounds per hour is 12,000 pounds.

B. The special limitations of OpSpec B043(b) prohibit the flight from being dispatched or released under the provisions of §§ 121.621 or 121.623 (international destination and alternate requirements) and require that the provisions of 14 CFR part 121, § 121.619 be observed (domestic destination alternate requirements). OpSpec B043(b) also requires that the weather at both the destination and alternate airport be forecasted to be above the applicable minimums at the estimated time of arrival. In addition, OpSpec B043 prohibits a certificate holder, who releases a flight according to B043 from simultaneously using B044.

1241. PLANNED RE-DISPATCH AND RE-RELEASE. 14 CFR part 121, § 121.631(c) permits the re-dispatch (flag) and re-release (supplemental) of extended range flights. These operations must be conducted in accordance with OpSpec B044.

OpSpec B044 prohibits the operator from conducting any other planned re-release or re-dispatch operations.

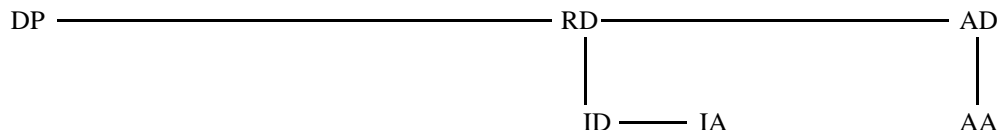
A. *En Route Reserve Fuel Requirements.* The relatively long en route times involved in international operations, as compared to domestic operations, increase the probability that actual winds aloft and terminal weather conditions will differ significantly from those forecasted. For this reason, part 121 requires that an additional increment of fuel be carried in operations outside the contiguous states, which is often referred to as en route reserve fuel. The en route reserve fuel is specified in terms of the fuel quantity required to fly for a specified time. En route reserve fuel is computed at the weight at which the aircraft is planned to arrive over the alternate airport or the destination airport when no alternate is required. The en route reserve fuel requirement has been shown to be necessary for safety, but it increases the cost and reduces the range at which extended range operations can be conducted. The planned re-dispatch or re-release procedures of OpSpec B044 are designed to reduce these penalties while maintaining an adequate level of safety. Section 121.645(b)(2) requires that flights beyond the contiguous states have on board at the time of a flight release, an increment of fuel (in addition to en route, alternate, reserve, and contingency fuels) which allows the airplane to fly for a period of time equal to 10% of the en route time. Under most circumstances, the en route reserve fuel is not consumed. Therefore, two flights arriving at the same destination from different departure points will arrive overhead the destination with different amounts of fuel remaining. The longer flights will arrive with proportionately more fuel.

ILLUSTRATION OF EN ROUTE FUEL RESERVE

<u>Fuel Increment</u>	<u>5-HOUR FLIGHT</u>		<u>10-HOUR FLIGHT</u>	
	<u>Time</u>	<u>Pounds</u>	<u>Time</u>	<u>Pounds</u>
En Route	5:00	70,000	10:00	160,000
En Route Reserve (1)	:30	7,200	1:00	14,000
Alternate (2)	:10	2,700	:10	2,700
<u>Int'l Reserve (3)</u>	<u>:30</u>	<u>10,000</u>	<u>:30</u>	<u>10,000</u>
Required Fuel		89,900		186,700
Normal Fuel On Board				
Overhead Destination		19,900		26,700
(1) + (2) + (3)				

ILLUSTRATION OF PLANNED EN ROUTE RE-RELEASE OPERATIONAL ANALYSIS

In this illustration, a flight is planned to operate from the departure point (DP) to the actual destination (AD). The flight is originally released to an intermediate destination (ID) via a re-dispatch point (RD). Point IA is the alternate airport for the intermediate destination and AA is the alternate airport for the actual destination. RD must be a common point on routes DP to ID and DP to AD.



<u>Fuel Increment</u>	<u>DP to ID</u>		<u>DP to AD</u>	
	<u>Time</u>	<u>Pounds</u>	<u>Time</u>	<u>Pounds</u>
En Route				
[DP to RD] (1)	6:00	84,000		
[RD to ID] (2)	1:00	14,000		
[RD to AD] (3)	4:00	64,000		
En Route Res.				
[10% DP to ID] (4)	:42	15,400		
[10% RD to AD] (5)	:24	5,600		
Alternate (6)	:10	2,700	:10	2,700
<u>Int.l Res.</u> (7)	<u>:30</u>	<u>10,000</u>	<u>:30</u>	<u>10,000</u>
Required [DP to ID] (1,2,4,6,&7)		126,000		
Required at RD point (3,5,6,&7)				82,300
Total Planned Fuel Load with Re-dispatch (1,3,5,6,&7)				166,300
Total Required Fuel Load without Re-dispatch (see previous illustration)				186,700

B. Fuel Requirements of part 121, Subparts U and I. Before a flight can be released from the departure point to the intermediate destination, all the fuel and weather requirements of Subparts U and performance requirements of Subpart I of part 121 must be met. The re-dispatch or re-release from the planned point to the actual destination is in an entirely separate dispatch or flight release and all the fuel and weather provisions of Subpart U and performance requirements of Subpart I must again be complied with at the time of the re-release, including the fuel requirements

of § 121.645(b)(1) through (4). The minimum equipment list (MEL) requirements do not apply, however, since the aircraft is airborne.

C. Special Conditions for Fuel Requirements. OpSpec B044(b) contains a number of special conditions which must also be observed by operators conducting planned re-dispatch or re-release operations, including the following:

(1) The re-dispatch or re-release point must be a point common to the flight route from the original departure point to the intermediate destination and to

the flight route from the original departure point to the final destination. This point must be specified on the original dispatch or flight release.

(2) A separate operational analysis must be prepared from the original departure point to the intermediate destination and from the re-dispatch or re-release point to the actual destination (see the preceding illustration, “Planned En Route Re-Release Operational Analysis”). A copy of the flight route analysis must be provided to the PIC and to the aircraft dispatcher or to the individual exercising operational control for a supplemental operator.

(3) OpSpec B044 requires that the aircraft dispatcher or flight follower transmit a message to the PIC authorizing the PIC to proceed to the actual destination. This change must be jointly approved by the PIC and the aircraft dispatcher or flight follower. The transmission of the re-dispatch or re-release message must be recorded by the aircraft dispatcher or flight follower and its receipt must then be recorded by the PIC. The flight must proceed to the intermediate destination in accordance with the original release unless the re-dispatch or re-release message is received by the PIC and the PIC’s concurrence is forwarded back to the operational control center.

(4) If at the time of re-dispatch or re-release, the route of flight is different from the one planned before takeoff, the new route must be included in the re-dispatch or re-release message.

(5) Fuel planning for re-dispatch or re-release must be in accordance with § 121.645 (the provisions of OpSpec B043 may not be used).

NOTE: Supplemental operators are not required by part 121 to be capable of contacting flights while they are en route. This capacity is required, however, as a condition for

operators conducting operations under OpSpec B044.

NOTE: A flight may not be released under OpSpec B044 when the operator or PIC knows two-way communications will not be available at the re-release point. Unforeseen circumstances may preclude communications, however, after the flight is en route. In such cases, the PIC must land at the interim destination, unless the operator’s GOM provides procedures for the PIC to follow which ensure the safe conduct of the flight to the intended destination.

D. Performance Limitations of Part 121, Subpart I. Inspectors must ensure that operators have complied with the performance limitations of Subpart I of part 121, both original and re-release. Some performance limitations follow:

(1) The flight must be planned so that the aircraft is not too heavy to land at the intermediate destination or alternate airport, in accordance with 14 CFR part 121, §§ 121.185 and 121.187 or §§ 121.195 and 121.197, as applicable. The operator may select a re-dispatch or re-release point beyond the intermediate destination to meet this requirement rather than selecting a point short of the intermediate destination, as is usually done when aircraft weight is not a factor.

(2) The operator must comply with the applicable en route, engine-out performance requirements of 14 CFR part 121, §§ 121.181 and 121.183, or §§ 121.191 and 121.193, or § 121.201, which can limit the dispatch or release weight of the aircraft.

1242. - 1252. RESERVED.

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